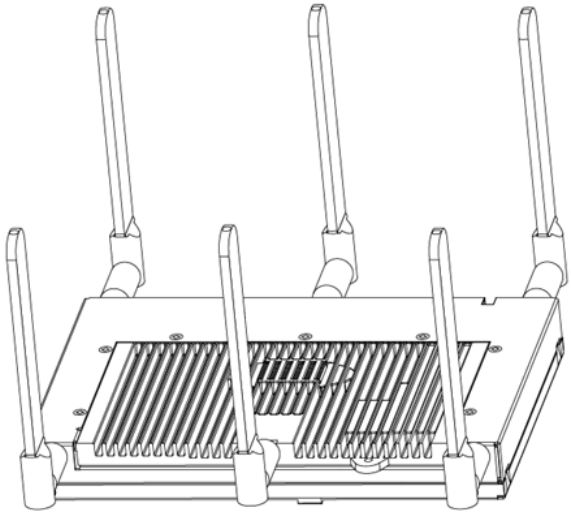
Brocade Mobility 7131

Installation Guide - Dependent Mode



BROCADE

53-1001567-04 Rev B

53-1001567-04

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Document History

Title	Publication number	Summary of changes	Date
Brocade Mobility 7131 Installation Guide - Dependent Mode	53-1001567-04	Updated WEEE logo information and Korea Class B Statement	May 2011

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About This Document

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Audience

This document is designed for system administrators with a working knowledge of Layer 2 and Layer 3 switching and routing.

If you are using a Brocade Layer 3 Switch, you should be familiar with the following protocols if applicable to your network – IP, RIP, OSPF, BGP, ISIS, IGMP, PIM, DVMRP, and VRRP.

Supported hardware and software

The following hardware platforms are supported by this release of this guide:

- Brocade Mobility 7131

Document conventions

This section describes text formatting conventions and important notice formats used in this document.

Notes, cautions, and warnings

The following notices and statements are used in this manual. They are listed below in order of increasing severity of potential hazards.

NOTE
A note provides a tip, guidance or advice, emphasizes important information, or provides a reference to related information.

CAUTION

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Contacting Brocade

When contacting Brocade support, please provide the following information:

- Serial number of the unit
- Model number or product name
- Software version

Customer Support Web Site

Brocade Support Central Web site, located at www.brocade.com/support provides information and online assistance including developer tools, software downloads, product manuals and online repair requests.

Downloads

http://www.brocade.com/support/

Manuals

http://www.brocade.com/support/

Because quality is our first concern at Brocade, we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to: *documentation@brocade.com*.

Provide the title and version number and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.

Email access and telephone access

Go to *http://www.brocade.com/services-support/index.page* for email and telephone contact information.

Warranty coverage

Contact Brocade Communications Systems using any of the methods listed above for information about the standard and extended warranties.

Chapter

Introduction 1

The Brocade Mobility 7131 is designed to meet the needs of large, distributed enterprises by converging the functionality of a thick access point and thin access port into a single device. This mode enables the deployment of a fully featured intelligent access point that can be centrally configured and managed using a Brocade wireless controller in either corporate headquarters or a *network operations center* (NOC). Additionally, compatibility with Brocade's RF Management Suite allows you to centrally plan, deploy, monitor and secure large Mobility 7131 deployments.

The Mobility 7131 provides small and medium-sized businesses a consolidated wired and wireless networking solution, all in a single device. The integrated router, gateway, firewall, DHCP and *Power-over-Ethernet* (PoE) simplify and reduce networking costs by eliminating the need to purchase and manage multiple pieces of equipment.

A dependent mode Mobility 7131 can be adopted, configured and managed like a thin access point from a wireless controller. The management of the dependent mode Mobility 7131 is conducted by a controller, only after the Mobility 7131 connects to a Brocade IP-RFS6000 or IP-RFS7000 model controller and receives its dependent mode (or adaptive) configuration. Refer to "Configuring dependent mode (adaptive) settings" on page 33 for additional information on dependent mode support on the Mobility 7131.

If new to the Mobility 7131, refer to the Mobility 7131 *Product Reference Guide* to familiarize yourself with access point technology and the feature set exclusive to the Brocade Mobility 7131. The guide is available, at *http://www.brocade.com/support/*.

Warnings

- Read all installation instructions and site survey reports, and verify correct equipment installation before connecting the Mobility 7131 to its power source.
- Remove jewelry and watches before installing this equipment.
- Verify the unit is grounded before connecting it to the power source.
- Verify any device connected to this unit is properly wired and grounded.

- Connect all power cords to a properly wired and grounded electrical circuit.
- Verify that the electrical circuits have appropriate overload protection.
- Attach only approved power cords to the device.
- Verify that the power connector and socket are accessible at all times during the operation of the equipment.
- Do not work with power circuits in dimly lit spaces.
- Do not install this equipment or work with its power circuits during thunderstorms or other weather conditions that could cause a power surge.
- Verify there is adequate ventilation around the device, and that ambient temperatures meet equipment operation specifications.
- Before installing or handling the Mobility 7131, have on hand an ESD wrist strap or other ESD voltage limiting device.

CAUTION

For safety reasons, the ESD wrist strap should contain a 1 meg ohm series resistor.

Site preparation

- Consult your site survey and network analysis reports to determine specific equipment placement, power drops, and so on.
- Assign installation responsibility to the appropriate personnel.
- Identify and document where all installed components are located.
- Provide a sufficient number of power drops for your equipment.
- Ensure adequate, dust-free ventilation to all installed equipment.
- Identify and prepare Ethernet and console port connections.
- Verify that cable lengths are within the maximum allowable distances for optimal signal transmission.

Chapter

Hardware Installation 2

A Mobility 7131 installation includes mounting the Mobility 7131 on a wall, ceiling T-bar or an above the ceiling orientation, connecting the Mobility 7131 to the network (LAN or WAN port connection), connecting antennas and applying power. Installation procedures vary for different environments.

A Mobility 7131 model access point has the following port designations:

- GE1/POE - LAN port
- GE2 - WAN Port

Precautions

Before installing the Mobility 7131 verify the following:

- Do not install in wet or dusty areas without additional protection. Contact a Brocade representative for more information.
- Verify the environment has a continuous temperature range between -20° C to 50° C.

Package contents

Check package contents for the correct model Mobility 7131 and applicable Mobility 7131 accessories. Each available configuration (at a minimum), contains:

- Mobility 7131 model access point (dependent SKU version)
- Mobility 7131 Install Guide (this guide)
- China ROHS Compliance addendum
- Wall mount screw and anchor kit
- Accessories Bag (4 rubber feet and a LED light pipe and badge with label for above the ceiling installations)

Contact the Brocade Support Center to report missing or improperly functioning items.

Mobility 7131 placement

For optimal performance, install the Mobility 7131 away from transformers, heavy-duty motors, fluorescent lights, microwave ovens, refrigerators and other industrial equipment. Signal loss can occur when metal, concrete, walls or floors block transmission. Install the Mobility 7131 in open areas or add access points as needed to improve coverage.

Place the Mobility 7131 using the following guidelines:

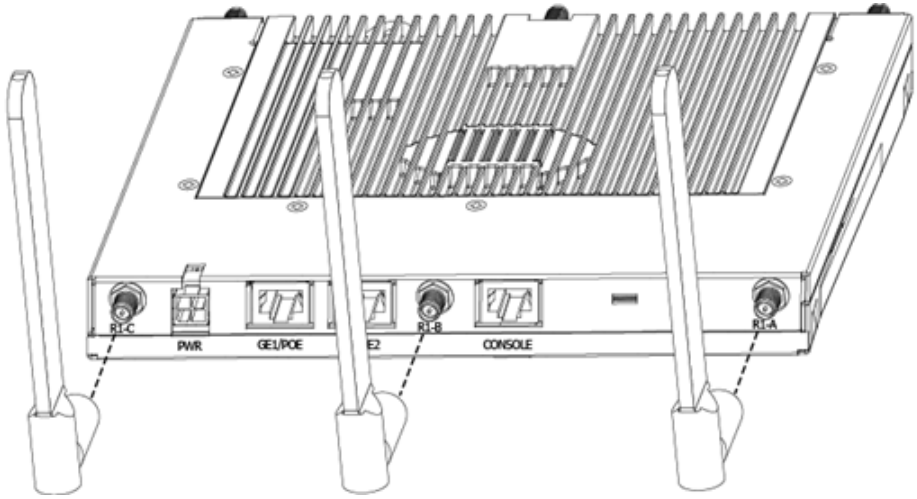
- Install the Mobility 7131 at an ideal height of 10 feet from the ground.
- Orient the Mobility 7131 antennas vertically for best reception.
- Point the Mobility 7131 antennas downward if attaching to the ceiling.

Brocade recommends conducting a site survey to define and document radio interference obstacles before installing the Mobility 7131 to maximize its radio coverage area.

Mobility 7131 antenna options

Brocade supports two antenna suites for the Mobility 7131. One antenna suite supporting the 2.4 GHz band and another antenna suite supporting the 5 GHz band. Select an antenna model best suited to the intended operational environment of your Mobility 7131.

Antenna connectors for single radio model Mobility 7131s are located on the same side of the access point as the LAN and WAN port connections (GE1/POE and GE2). On single radio versions, the R-SMA connectors can support both bands and should be connected to a R-SMA dual-band antenna or an appropriate single band antenna.



R1 defines the Mobility 7131's radio 1 antenna connectors and R2 defines the Mobility 7131's radio 2 antenna connectors.

Certain Rogue AP Detection features use a radio to perform dual-band scanning. The dedicated radio should be connected to an appropriate dual-band dipole antenna (Part No. ML-2452-APA2-01).

The 2.4 GHz antenna suite includes the following models:

Part Number	Antenna Type	Nominal Net Gain (dBi)
ML-2499-11PNA2-01R	Wide Angle Directional	8.5
ML-2499-HPA3-01R	Omni-Directional Antenna	3.3
ML-2499-BYGA2-01R	Yagi Antenna	13.9
ML-2452-APA2-01	Dual-Band	3.0
ML-2452-PTA2M3X3-2	Facade with 6 Element Antenna Module	2.0
ML-2452-PTA3M3-036	3 Port MIMO Antenna	3.0

NOTE
An additional adapter is required to use ML-2499-11PNA2-01R and ML-2499-BYGA2-01R model antennas. Please contact Brocade for more information.

The 5 GHz antenna suite includes the following models:

Part Number	Antenna Type	Nominal Net Gain (dBi)
ML-5299-WPNA1-01R	Panel Antenna	13.0
ML-5299-HPA1-01R	Wide-Band Omni-Directional Antenna	5.0
ML-2452-APA2-01	Dual-Band	4.0
ML-2452-PTA2M3X3-2	Facade with 6 Element Antenna Module	2.0
ML-2452-PTA3M3-036	3 Port MIMO Antenna	3.0

For detailed specifications on the antennas available to the Mobility 7131, refer to the Mobility 7131 *Product Reference Guide* or the *Enterprise Wireless LAN Antenna Specification Guide*. Both guides are available at *http://www.brocade.com/support*.

Mounting the Mobility 7131

The Mobility 7131 can attach to a wall, mount under a suspended T-Bar or above a ceiling (plenum or attic). Choose one of the following mounting options based on the physical environment of the coverage area. Do not mount the Mobility 7131 in a location that has not been approved in a site survey.

Wall mounting

Wall mounting requires hanging the Mobility 7131 along its width (or length) using the pair of slots on the bottom of the unit and using the Mobility 7131 mounting template (on the next page) for the screws.

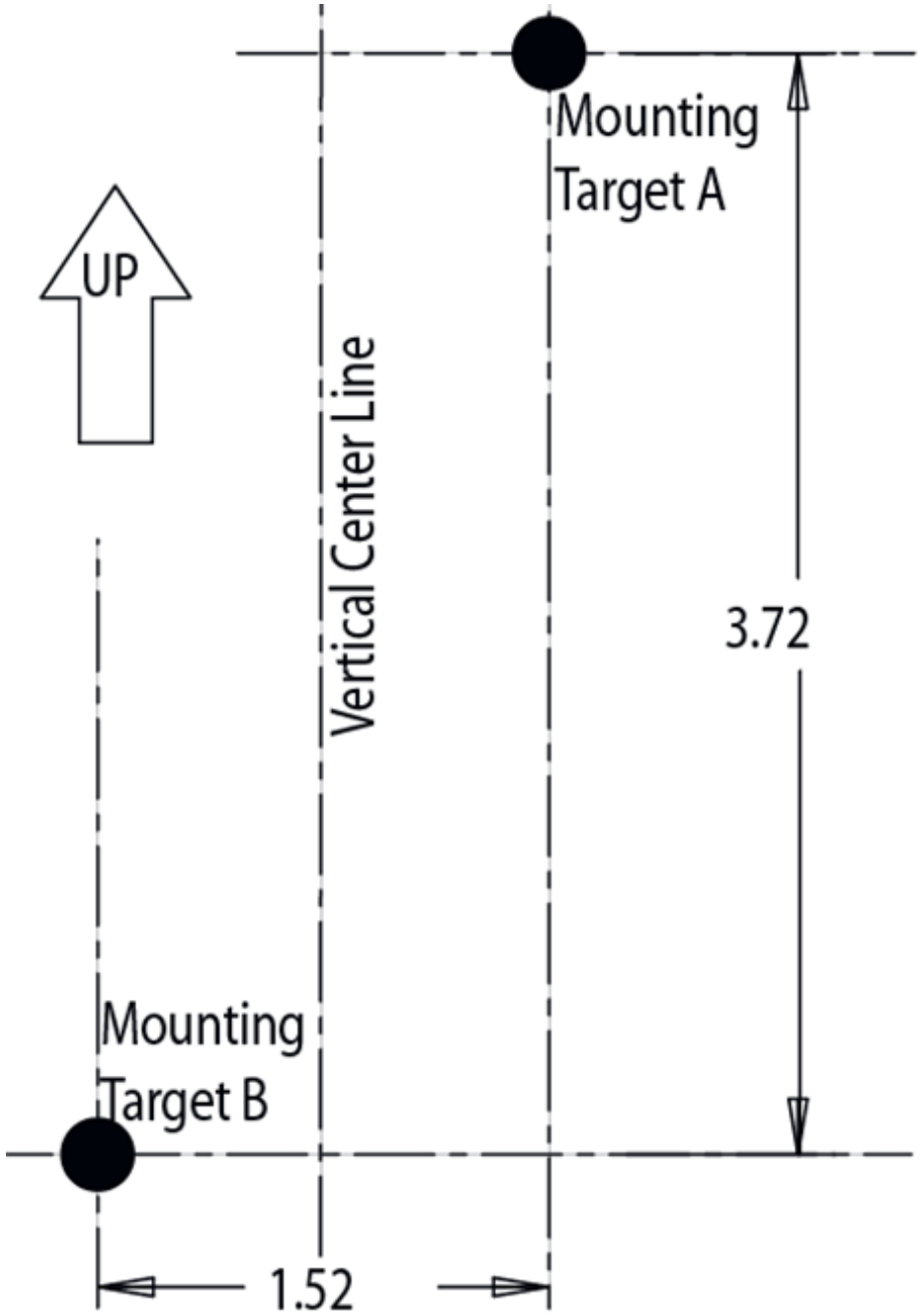
CAUTION

A Mobility 7131 should be wall mounted to concrete or plaster-wall-board (dry wall) only. Do not wall mount a Mobility 7131 to combustible surfaces.

The hardware and tools (customer provided) required to install the Mobility 7131 on a wall consists of:

- Two Phillips pan head self-tapping screws
  (ANSI Standard) #6-18 X 0.875in. Type A or AB Self-Tapping screw, or
  (ANSI Standard Metric) M3.5 X 0.6 X 20mm Type D Self-Tapping screw
- Two wall anchors
- Wall mount template (included on the next page)
- Security cable (optional)

2 Mounting the Mobility 7131


Mounting
Target A
UP
Vertical Center Line
3.72
Mounting
Target B
1.52

To mount the Mobility 7131 on a wall using the provided template:

1. Photocopy the template (on the previous page) to a blank piece of paper. Do not reduce or enlarge the scale of the template.

CAUTION

If printing the mounting template (on the previous page) from an electronic PDF, dimensionally confirm the template by measuring each value for accuracy.

2. Tape the template to the wall mounting surface.
   - If the installation requires the antenna be positioned vertically, the centerline reference (of the template) needs to be positioned vertically. The cabling shall exit the access point in a vertical direction.
   - If the installation requires the antenna be positioned horizontally, the vertical centerline (of the template) needs to be positioned horizontally. The cabling shall exit the access point in a horizontal direction.
3. At mounting targets A and B, mark the mounting surface through the template at the target center.
4. Discard the mounting template.
5. At each point, drill a hole in the wall, insert an anchor, screw into the anchor the wall mounting screw and stop when there is 1mm between the screw head and the wall.

   If pre-drilling a hole, the recommended hole size is 2.8mm (0.11in.) if the screws are going directly into the wall and 6mm (0.23in.) if wall anchors are being used.
6. If required, install and attach a security cable to the Mobility 7131 lock port.
7. Attach the antennas to their correct connectors.
8. For information on the antennas available to the Mobility 7131, see "Mobility 7131 antenna options" on page 4.
9. Place the large center opening of each of the mount slots over the screw heads.
10. Slide the Mobility 7131 down along the mounting surface to hang the mount slots on the screw heads.

CAUTION

Ensure you are placing the antennas on the correct connectors (depending on your single or dual-radio model and frequency used) to ensure the successful operation of the Mobility 7131.

NOTE

It is recommended the Mobility 7131 be mounted with the RJ45 cable connector oriented upwards or downwards to ensure proper operation.

11. Cable the Mobility 7131 using either Power over Ethernet (PoE) or an approved line cord and power supply.

    For PoE installations, connect an RJ-45 CAT5e (or CAT6) Ethernet cable between a PoE switch port and the BR7131 GE1/POE port.

    For standard power adapter and line cord installations:

    a. Connect a RJ-45 CAT5e (or CAT6) Ethernet cable between the network data supply (host) and the Mobility 7131 GE1/POE or GE2 port.

    b. Verify the power adapter is correctly rated according the country of operation.

    c. Connect the power supply line cord to the power adapter.

    d. Attach the power adapter cable into the power connector on the Mobility 7131.

    e. Attach the power supply line cord to a power supply.

CAUTION

Do not actually connect to the power source until the cabling portion of the installation is complete.

12. Verify the behavior of the Mobility 7131 LEDs. For more information, see "LED indicators" on page 18.

13. The Mobility 7131 is ready to configure. For information on basic Mobility 7131 device configuration, see "Configuring basic device settings" on page 24.

Suspended ceiling T-bar installations

A suspended ceiling mount requires holding the Mobility 7131 up against the T-bar of a suspended ceiling grid and twisting the Mobility 7131 chassis onto the T-bar.

The mounting tools (customer provided) and hardware required to install the Mobility 7131 on a ceiling
T-bar consists of:

- Safety wire (recommended and customer supplied)
- Security cable (optional and customer supplied)

To install the Mobility 7131 on a ceiling T-bar:

1. Brocade recommends you loop a safety wire — with a diameter of at least 1.01 mm (.04 in.), but no more than 0.158 mm (.0625 in.) — through the tie post (above the Mobility 7131's console connector) and secure the loop.
2. If desired, install and attach a security cable to the Mobility 7131 lock port.
3. Attach the antennas to their correct connectors.

   For information on the antennas available to the Mobility 7131, see "Mobility 7131 antenna options" on page 4.

CAUTION

Ensure you are placing the antennas on the correct connectors (depending on your single or dual-radio model and frequency used) to ensure the successful operation of the Mobility 7131.

4. Cable the Mobility 7131 using either Power over Ethernet (PoE) or an approved line cord and power supply.

   For PoE installations, connect an RJ-45 CAT5e (or CAT6) Ethernet cable between a PoE switch port and the BR7131 GE1/POE port.

   For standard power adapter and line cord installations:

   a. Connect a RJ-45 Ethernet cable between the network data supply (host) and the Mobility 7131 GE1/POE or GE2 port.

   b. Verify the power adapter is correctly rated according the country of operation.

   c. Connect the power supply line cord to the power adapter.

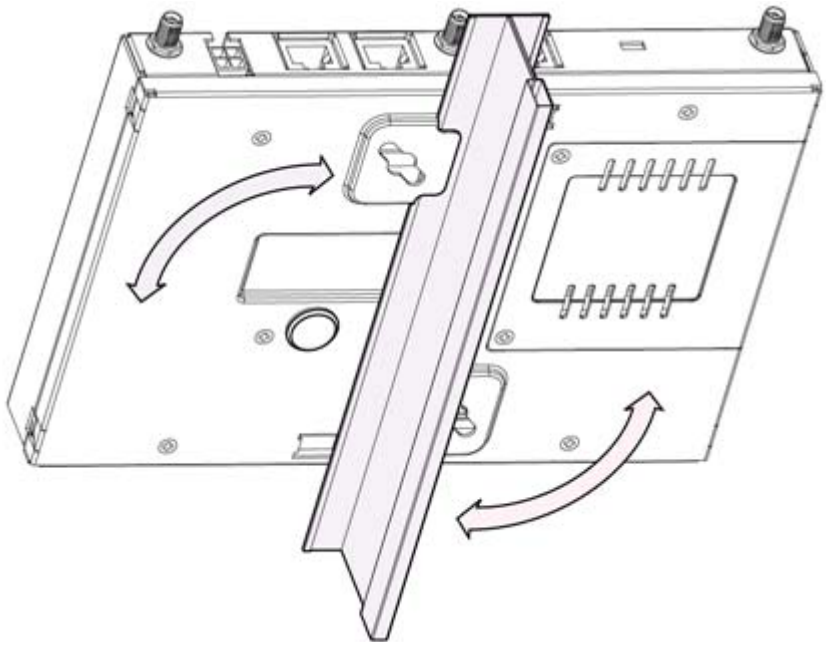
d. Attach the power adapter cable into the power connector on the Mobility 7131.

e. Attach the power supply line cord to a power supply.

CAUTION

Do not actually connect to the power source until the cabling portion of the installation is complete.

5. Verify the behavior of the Mobility 7131 LEDs. For more information, see "LED indicators" on page 18.
6. Align the bottom of the ceiling T-bar with the back of the Mobility 7131.
7. Orient the Mobility 7131 chassis by its length and the length of the ceiling T-bar.
8. Rotate the Mobility 7131 chassis 45 degrees clockwise.
9. Push the back of the Mobility 7131 chassis on to the bottom of the ceiling T-bar.
10. Rotate the Mobility 7131 chassis 45 degrees counter-clockwise.
    The clips click as they fasten to the T-bar.



11. The Mobility 7131 is ready to configure. For information on basic Mobility 7131 device configuration, see "Configuring basic device settings" on page 24.

NOTE
If the Mobility 7131 is utilizing remote management antennas, a wire cover can be used to provide a clean finished look to the installation. Contact Brocade for more information.

Above the ceiling (plenum) installations

A Mobility 7131 above the ceiling installation requires placing the Mobility 7131 above a suspended ceiling and installing the provided light pipe under the ceiling tile for viewing the rear panel status LEDs of the unit. An above the ceiling Mobility 7131 installation enables installations compliant with drop ceilings, suspended ceilings and industry standard tiles from .625 to .75 inches thick.

NOTE
The Mobility 7131 is Plenum rated to UL2043 and NEC1999 for above the ceiling installations.

CAUTION

Brocade does not recommend mounting the Mobility 7131 directly to any suspended ceiling tile with a thickness less than 12.7mm (0.5in.) or a suspended ceiling tile with an unsupported span greater than 660mm (26in.). Brocade strongly recommends fitting the Mobility 7131 with a safety wire suitable for supporting the weight of the device. The safety wire should be a standard ceiling suspension cable or equivalent steel wire between 1.59mm (.062in.) and 2.5mm (.10in.) in diameter.

The mounting hardware required to install the Mobility 7131 above a ceiling consists of:

- Light pipe
- Badge for light pipe
- Decal for badge
- Safety wire (strongly recommended)
- Security cable (optional)

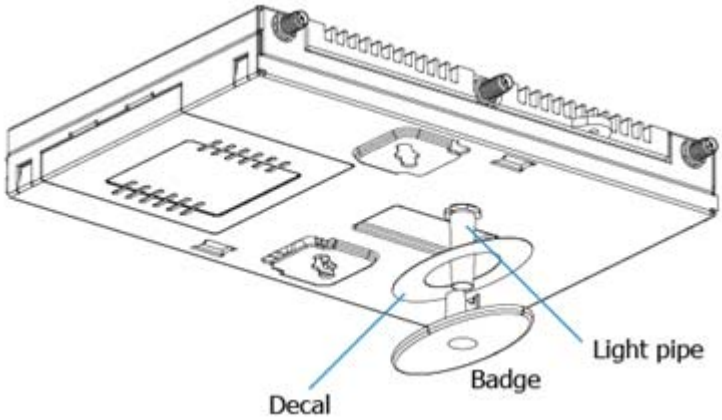
To install the Mobility 7131 above a ceiling:

1. If possible, remove the adjacent ceiling tile from its frame and place it aside.
2. If required, install a safety wire, between 1.5mm (.06in.) and 2.5mm (.10in.) in diameter, in the ceiling space.
3. If required, install and attach a security cable to the Mobility 7131's lock port.
4. Mark a point on the finished side of the tile where the light pipe is to be located.
5. Create a light pipe path hole in the target position on the ceiling tile.
6. Use a drill to make a hole in the tile the approximate size of the Mobility 7131 LED light pipe.

CAUTION

Brocade recommends care be taken not to damage the finished surface of the ceiling tile when creating the light pipe hole and installing the light pipe.

7. Remove the light pipe's rubber stopper (from the Mobility 7131) before installing the light pipe.
8. Connect the light pipe to the bottom of the Mobility 7131. Align the tabs and rotate approximately 90 degrees. Do not over tighten



9. Fit the light pipe into hole in the tile from its unfinished side.
10. Place the decal on the back of the badge and slide the badge onto the light pipe from the finished side of the tile.
11. Attach the antennas to their correct connectors.

    For information on the antennas available to the Mobility 7131, see "Mobility 7131 antenna options" on page 4.

CAUTION

Ensure you are placing the antennas on the correct connectors (depending on your single or dual-radio model and frequency used) to ensure the successful operation of the Mobility 7131.

12. Brocade recommends attaching safety wire to the Mobility 7131 safety wire tie point or security cable (if used) to the Mobility 7131's lock port.
13. Align the ceiling tile into its former ceiling space.
14. Cable the Mobility 7131 using either Power over Ethernet (PoE) or an approved line cord and power supply.

    For PoE installations, connect an RJ-45 CAT5e (or CAT6) Ethernet cable between a PoE switch port and the BR7131 GE1/POE port.

    For standard power adapter and line cord installations:

    a. Connect a RJ-45 Ethernet cable between the network data supply (host) and the Mobility 7131 GE1/POE or GE2 port.

    b. Verify the power adapter is correctly rated according the country of operation.

    c. Connect the power supply line cord to the power adapter.

    d. Attach the power adapter cable into the power connector on the Mobility 7131.

    e. Attach the power supply line cord to a power supply.

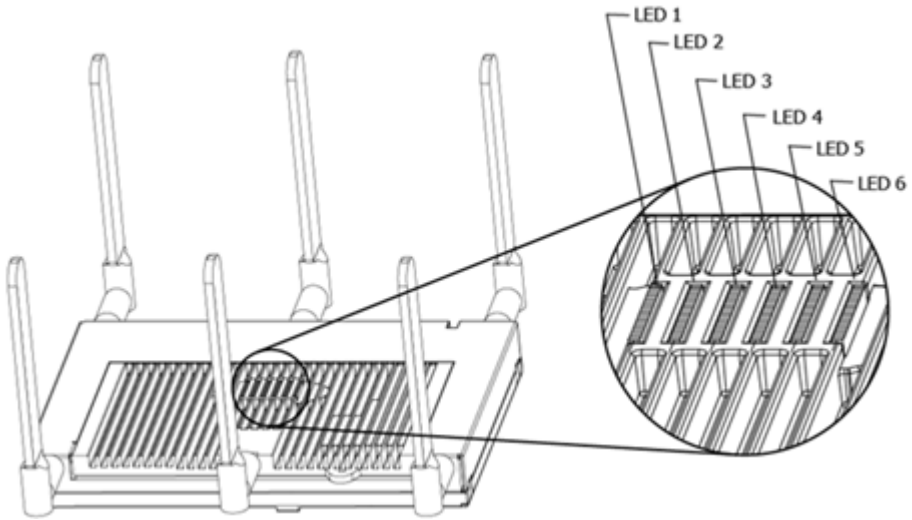
CAUTION

Do not actually connect to the power source until the cabling portion of the installation is complete.

15. Verify the behavior of the Mobility 7131 LED light pipe. For more information, see "LED indicators" on page 18.
16. Place the ceiling tile back in its frame and verify it is secure.
17. The Mobility 7131 is ready to configure. For information on basic Mobility 7131 device configuration, see "Configuring basic device settings" on page 24.

LED indicators

LEDs one through five illuminate on the front of the Mobility 7131 (on top of the Mobility 7131 housing) for dual radios models. LED 6 is not used for dual radio models. LEDs one through four illuminate for single radio models. LEDs 5 and 6 are not used for single radio models. One LED (LED 7 for above the ceiling installations) is located on the back of the device.



NOTE
The LED blink rate is proportional to activity. The busiest traffic corresponds to the fastest blink, while the slowest traffic corresponds to slowest blink.

NOTE
Depending on how the 5 GHz and 2.4 GHz radios are configured, the LEDs will blink at different intervals between amber and yellow (5 GHz radio) and emerald and yellow (2.4 GHz radio).

The LEDs on the top housing of the Mobility 7131 are clearly visible in wall and below ceiling installations. The top housing LEDs have the following display and functionality:

Dual radio (2.4/5 GHz) Mobility 7131 with sensor slot LEDs

A dual radio (2.4/5 GHz) model Mobility 7131 has the following unique LED behavior:

LED 1	LED 2	LED 3	LED 4 - 5 GHz	LED 5 - 2.4 GHz	LED 6
Blinking **Red** indicates booting. Solid **Red** defines a failure condition. **White** defines normal operation	**Green** defines normal GE1 operation. **Yellow** defines a collision	**Green** defines normal GE2 operation. **Yellow** defines a collision	**Amber** defines 5 GHz radio as configured. When functioning as a sensor, LED alternates between **Amber** and **Yellow**. The blink interval is 0.5 seconds.	**Emerald** defines 2.4 GHz radio as configured. When functioning as a sensor, LED alternates between **Emerald** and **Yellow**. The blink interval is 0.5 seconds.	Not Used

Single radio 2.4 GHz Mobility 7131 LEDs

The single 2.4 GHz radio model Mobility 7131 has the following unique LED behavior:

LED 1	LED 2	LED 3	LED 4 - 5 GHz	LED 5 - 2.4 GHz	LED 6
Blinking **Red** indicates booting. Solid **Red** defines a failure condition. **White** defines normal operation	**Green** defines normal GE1 operation. **Yellow** defines a collision	**Green** defines normal GE2 operation. **Yellow** defines a collision	Off	**Emerald** defines 2.4 GHz radio as configured. When functioning as a sensor, LED alternates between **Emerald** and **Yellow**. The blink interval is 0.5 seconds.	Not Used

Single radio 5 GHz Mobility 7131 LEDs

The single 5 GHz radio model Mobility 7131 has the following unique LED behavior:

LED 1	LED 2	LED 3	LED 4 - 5 GHz	LED 5 - 2.4 GHz	LED 6
Blinking **Red** indicates booting. Solid **Red** defines a failure condition. **White** defines normal operation	**Green** defines normal GE1 operation. **Yellow** defines a collision	**Green** defines normal GE2 operation. **Yellow** defines a collision	**Amber** defines 5 GHz radio as configured. When functioning as a sensor, LED alternates between **Amber** and **Yellow**. The blink interval is 0.5 seconds.	Off	Not Used

Rear Mobility 7131 LED

The LED on the rear (bottom) of the Mobility 7131 is viewed using a single (customer installed) extended light pipe, adjusted as required to suit above the ceiling installations. A LED displayed using the light pipe has the following display and functionality:

LED 7
Blinking **Red** indicates booting. Solid **Red** defines a failure condition. **White** defines normal operation.

Chapter

Basic Mobility 7131 Configuration 3

For the basic setup described in this guide, the Java-based Web UI will be used to configure the Mobility 7131. To access the Mobility 7131 through the GE1/POE port, the GE1/POE port default setting is DHCP client. For this example, the Mobility 7131's WAN interface will be used to connect to the access point. The default WAN IP address is 10.1.1.1. For optimal viewing of the Mobility 7131 Web UI, the screen resolution should be set to 1024 x 768 pixels or greater.

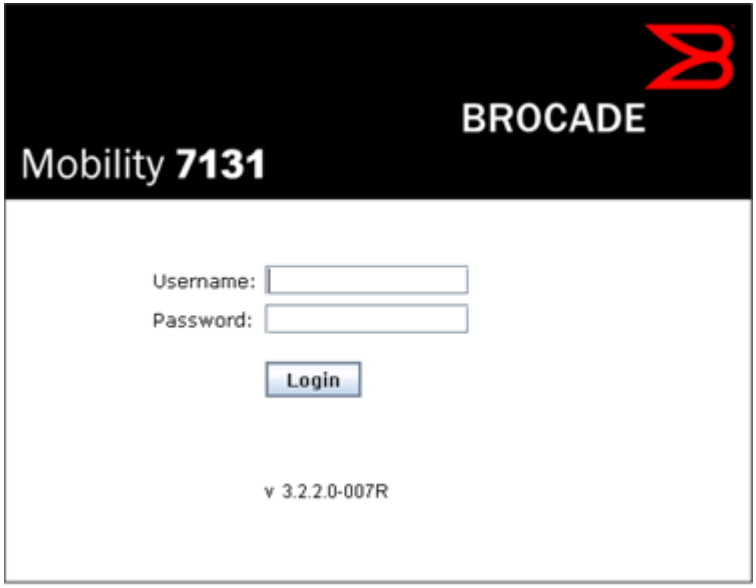
NOTE
For advanced configuration options beyond the scope of this guide, refer to the Mobility 7131 *Product Reference Guide.* The guide is available on the Brocade Web site, at *http://www.brocade.com/support/*.

1. Start a browser and enter the following IP address in the address field: https://10.1.1.1

   NOTE
   For optimum compatibility, use Sun Microsystems' JRE 1.5 or higher (available from Sun's Website), and be sure to disable Microsoft's Java Virtual Machine if installed.

   NOTE
   The computer being used should be configured to use the same IP address and subnet mask as the Mobility 7131.

The Mobility 7131 login screen displays:



2. Log in using *admin* as the default User ID and *admin123* as the default password. If the default login is successful, the *Change Admin Password* window displays.
3. Change the password.

Enter the current password and a new admin password in fields provided, and click *Apply*. Once the admin password has been updated, a warning message displays stating the Mobility 7131 could be operating illegally unless set to operate in the correct country. Proceed to "Configuring basic device settings" on page 24 to validate the country setting.

NOTE
Though the Mobility 7131 can have its basic settings defined using a number of different screens, Brocade recommends using the Mobility 7131 *Quick Setup* screen to define a minimum required configuration from one location.

Resetting the Mobility 7131 password

The Mobility 7131 *Command Line Interface* (CLI) enables users who forget their password to reset it to the factory default (admin123). From there, a new password can be defined. To reset the Mobility 7131 password back to its default setting:

1. Connect one end of a null modem serial cable to the Mobility 7131's serial connector. Attach the other end of the null modem serial cable to the serial port of a PC running HyperTerminal or a similar emulation program.
2. Set the HyperTerminal program to use 19200 baud, 8 data bits, 1 stop bit, no parity, no flow control and auto-detect for terminal emulation.
3. Press <ESC> or <Enter> to access the Mobility 7131 CLI. A serial connection has now been established and the user should be able to view the serial connection window.
4. Reset the Mobility 7131. A Mobility 7131 can be reset by removing and re-inserting the LAN (GE1/POE) cable or removing and re-inserting the power cable.

   As the Mobility 7131 is re-booting, a "Press esc key to run boot firmware" message displays.
5. Quickly press <ESC>.

   If the <ESC> key is pressed within three seconds a boot> prompt displays.

CAUTION

If the <ESC> key is not pressed within three seconds after the "Press esc key to run boot firmware" message displays, the Mobility 7131 will continue to boot.

6. Type the following at the boot prompt: *passwd default*
7. Reset the Mobility 7131 by typing the following at the boot prompt: *reset system*

   When the Mobility 7131 re-boots again, the password will return to its default value of "admin123." You can now access the Mobility 7131.

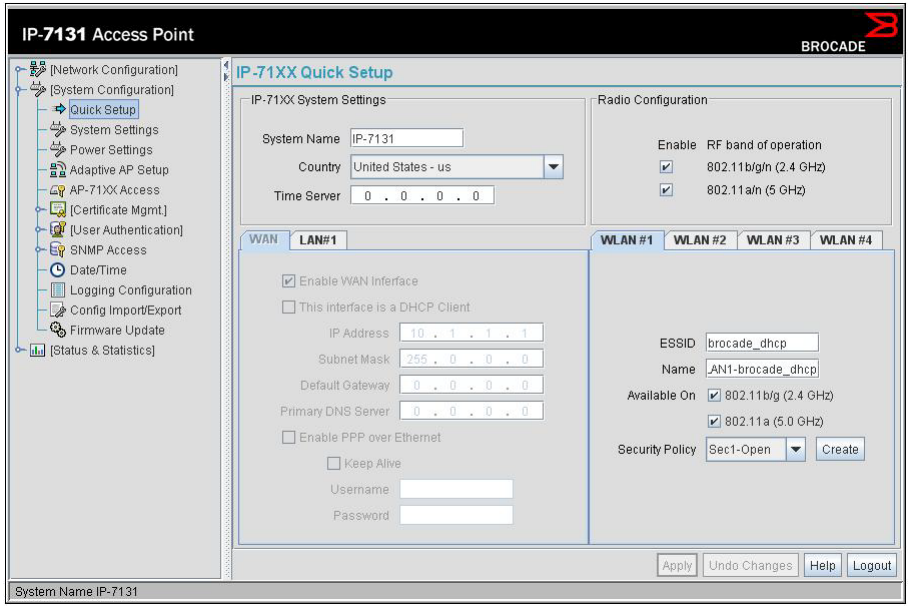
Configuring basic device settings

Configure a set of minimum required device settings within the Mobility 7131 *Quick Setup* screen. The values defined within the Quick Setup screen are also configurable in numerous other locations within the Mobility 7131 menu tree. When you change the settings in the Quick Setup screen, the values also change within the screen where these parameters also exist. Additionally, if the values are updated in these other screens, the values initially set within the Quick Setup screen will be updated. The following table illustrates the Mobility 7131's default configuration.

WAN	LAN 1	LAN 2	Access using WAN port
Static IP: 10.1.1.1 Static Mask: 255.0.0.0	DHCP Client Auto-Update Enabled Default Gateway Ethernet Port Enabled	Disabled	HTTPS, SSH, SNMP, Telnet: Enabled

To define a basic Mobility 7131 configuration:

1. Select *System Configuration -> Quick Setup* from the Mobility 7131 menu tree.



2. Enter a *System Name* for the Mobility 7131. The System Name is useful if multiple devices are being administered.

3. Select the *Country* for the Mobility 7131's country of operation from the drop-down menu.

   The Mobility 7131 prompts the user for the correct country code on the first login. A warning message also displays stating that an incorrect country setting may result in illegal radio operation. Selecting the correct country is central to legally operating the Mobility 7131. Each country has its own regulatory restrictions concerning electromagnetic emissions and the maximum RF signal strength that can be transmitted. To ensure compliance with national and local laws, be sure to set the Country accurately. CLI and MIB users cannot configure their Mobility 7131 until a two character country code (for example, United States - us) is set.

NOTE
The System Name and Country are also configurable within the *System Setting*s screen. Refer to the Mobility 7131 *Product Reference Guide* to optionally set a system location and admin email address for the Mobility 7131 or to change other default settings.

4. Optionally enter the IP address of the server used to provide system time to the Mobility 7131 within the Time Server field.

   Once the IP address is entered, the Mobility 7131's *Network Time Protocol (NTP)* functionality is engaged automatically. Refer to the Mobility 7131 *Product Reference Guide* for information on defining alternate time servers and setting a synchronization interval for the Mobility 7131 to adjust its displayed time.

5. Click the *WAN* tab to set a minimum set of parameters for using the WAN interface.

   a. Select the *Enable WAN Interface* checkbox to enable a connection between the Mobility 7131 and a larger network or outside world through the WAN port. Disable this option to effectively isolate the Mobility 7131's WAN connection. No connections to a larger network or the Internet will be possible. Clients cannot communicate beyond the configured subnets.

   b. Select the *This Interface is a DHCP Client* checkbox to enable DHCP for the Mobility 7131 WAN connection. This is useful, if the target corporate network or *Internet Service Provider (ISP)* uses DHCP. DHCP is a protocol that includes mechanisms for IP address allocation and delivery of host-specific configuration parameters from a DHCP server to a host. Some of these parameters are IP address, network mask, and gateway.

   c. Specify an *IP address* for the Mobility 7131's WAN connection. An IP address uses a series of four numbers expressed in dot notation, for example, 190.188.12.1.

   d. Specify a *Subnet Mask* for the Mobility 7131's WAN connection. This number is available from the ISP for a DSL or cable-modem connection, or from an administrator if the Mobility 7131 connects to a larger network. A subnet mask uses a series of four numbers expressed in dot notation. For example, 255.255.255.0 is a valid subnet mask.

   e. Specify a *Default Gateway* address for the Mobility 7131's WAN connection. The ISP or a network administrator provides this address.

   f. Specify the address of a *Primary DNS Server*. The ISP or a network administrator provides this address.

6. Optionally, use the *Enable PPP over Ethernet* checkbox to enable *Point-to-Point Protocol over Ethernet (PPPoE)* for a high-speed connection that supports this protocol. Most DSL providers are currently using or deploying this protocol. PPPoE is a data-link protocol for dialup connections. PPPoE will allow the Mobility 7131 to use a broadband modem (DSL, cable modem, etc.) for access to high-speed data networks.

    a. Select the *Keep Alive* checkbox to enable occasional communications over the WAN port even when client communications to the WAN are idle. Some ISPs terminate inactive connections, while others do not. In either case, enabling Keep-Alive maintains the WAN connection, even when there is no traffic. If the ISP drops the connection after the idle time, the Mobility 7131 automatically reestablishes the connection to the ISP.

    b. Specify a *Username* entered when connecting to the ISP. When the Internet session begins, the ISP authenticates the username.

    c. Specify a *Password* entered when connecting to the ISP. When the Internet session starts, the ISP authenticates the password.

7. Click the *LAN* tab to set a minimum set of parameters to use the Mobility 7131 LAN interface.

    a. Select the *Enable LAN Interface* checkbox to forward data traffic over the Mobility 7131 LAN connection. The LAN connection is enabled by default.

    b. Use the *This Interface* drop-down menu to specify how network address information is defined over the Mobility 7131's LAN connection. Select *DHCP Client* if the larger corporate network uses DHCP. DHCP is a protocol that includes mechanisms for IP address allocation and delivery of host-specific configuration parameters from a DHCP server to a host. Some of these parameters are IP address, network mask, and gateway. Select *DHCP Server* to use the Mobility 7131 as a DHCP server over the LAN connection.

    c. Enter the network-assigned *IP Address* of the Mobility 7131.

    d. The *Subnet Mask* defines the size of the subnet. The first two sets of numbers specify the network domain, the next set specifies the subset of hosts within a larger network. These values help divide a network into subnetworks and simplify routing and data transmission.

    e. Enter a *Default Gateway* to define the IP address of a router the Mobility 7131 uses on the Ethernet as its default gateway.

    f. Enter the *Primary DNS Server* IP address.

g. If using DHCP Server, use the *Address Assignment Range* parameter to specify a range of IP address reserved for mapping clients to IP addresses. If a manually (static) mapped IP address is within the IP address range specified, that IP address could still be assigned to another client. To avoid this, ensure all statically mapped IP addresses are outside of the IP address range assigned to the DHCP server.

NOTE
For additional Mobility 7131 port configuration options, as well as radio, WLAN and Quality of Service (QoS) options, refer to the Mobility 7131 *Product Reference Guide.*

8. Enable the radio(s) using the *Radio Enable* checkbox(es). If using a single radio model, enable the radio, then select either 802.11a/n (5 GHz) or 802.11b/g/n (2.4 GHz) from the *RF Band of Operation* field. Only one RF band option at a time is permissible in a single-radio model. If using a dual-radio Mobility 7131, the user can enable both RF bands.
9. Select the *WLAN #1* tab (WLANs 1 - 4 are available within the Quick Setup screen) to define its ESSID security scheme for basic operation.

NOTE
A maximum of 16 WLANs are configurable within the Mobility 7131 Wireless Configuration screen. The limitation of 16 WLANs exists regardless of the number of radios supported.

a. Enter the *Extended Services Set Identification (ESSID)* and name associated with the WLAN.

b. Use the *Available On* checkboxes to define whether the target WLAN is operating over the 802.11a/n or 802.11b/g/n radio. Ensure the radio selected has been enabled (see step 8).

10. Once the WLAN's radio designations have been made, the radio must be configured in respect to intended 2.4 or 5 GHz radio traffic and the antennas used. Refer to *Network Configuration -> Wireless -> Radio Configuration -> Radio1 (or Radio2)*, and configure the Radio Settings field (at a minimum). If you know the radio's Properties, Performance and Beacon Settings, those fields can also be defined at this time.

Define the Channel Settings, Power Level and 802.11 mode in respect to the 2.4 or 5 GHz 802.11b/g/n or 802.11a/n radio traffic and anticipated gain of the antennas.

CAUTION

Only a qualified wireless network administrator should set the access point radio configuration. Refer to the Mobility 7131 *Product Reference Guide* **for an understanding of the configurable values involved and their implications. To access the guide, go to** *http://www.brocade.com/support/*.

NOTE

Even a Mobility 7131 configured with minimal values must protect its data against theft and corruption. A security policy should be configured for WLAN1 as part of the basic configuration outlined in this guide. A security policy can be configured for the WLAN from within the Quick Setup screen. Policies can be defined over time and saved to be used as needed as the Mobility 7131's security requirements change. Brocade recommends you familiarize yourself with the security options available on the Mobility 7131 before defining a security policy.

11. Click *Apply* to save any changes to the Mobility 7131 Quick Setup screen. Navigating away from the screen without clicking Apply results in all changes to the screens being lost, unless you use the *Un-applied Changes* pop-up window to overwrite the current settings.
12. Click *Undo Changes* (if necessary) to undo any changes made. Undo Changes reverts the settings displayed on the Mobility 7131 Quick Setup screen to the last saved configuration.

Configuring basic Mobility 7131 security

For testing basic connectivity, there is no reason to configure a server supported authentication scheme. WEP 128 is described in this guide as a basic security scheme sufficient to protect the Mobility 7131's initial transmissions. For details on configuring more sophisticated authentication and encryption options available to the Mobility 7131, refer to the Mobility 7131 *Product Reference Guide.* The guide is available at *http://www.brocade.com/support/*.

To configure WEP 128:

1. From the Mobility 7131 Quick Setup screen, click the *Create* button to the right of the Security Policy item.

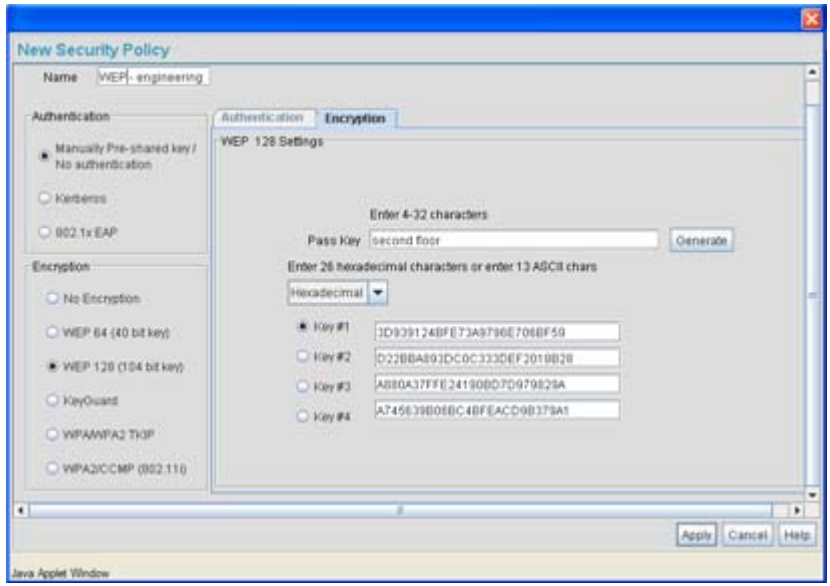
   The *New Security Policy* screen displays with the *Manually Pre-shared key/No authentication* and *No Encryption* options selected. Naming and saving such a policy (as is) would provide no security and might only make sense in a guest network wherein no sensitive data is either transmitted or received. Consequently, at a minimum, a basic security scheme (in this case WEP 128) is recommended.

   NOTE
   For information on configuring the other (more sophisticated) encryption and authentication options available to the Mobility 7131, refer to the Mobility 7131 *Product Reference Guide.* The guide is available at *http://www.brocade.com/support/*.

2. Ensure the *Name* of the security policy entered suits the intended configuration or function of the policy.

   Multiple WLANs can share the same security policy, so be careful not to name security policies after specific WLANs or risk defining a WLAN to single policy. Brocade recommends naming the policy after the attributes of the authentication or encryption type selected.

3. Select the *WEP 128 (104 bit key)* checkbox.The *WEP 128 Setting* field displays within the New Security Policy screen.



4. Configure the *WEP 128 Setting* field as required to define the Pass Key used to generate the WEP keys.

Pass key	Specify a 4 to 32 character pass key and click the *Generate* button. The Mobility 7131, other proprietary routers and Brocade Clients use the same algorithm to convert an ASCII string to the same hexadecimal number. Non-Brocade clients and devices need to enter WEP keys manually as hexadecimal numbers. The Mobility 7131 and its target client(s) must use the same pass key to interoperate.
Keys #1-4	Use the *Key #1-4* fields to specify key numbers. For WEP 64 (40-bit key), the keys are 10 hexadecimal characters in length. For WEP 128 (104-bit key), the keys are 26 hexadecimal characters in length. Select one of these keys for activation by clicking its radio button. The Mobility 7131 and its target client(s) must use the same key to interoperate.

5. Click the *Apply* button to save the security policy and return to the Mobility 7131 *Quick Setup* screen.

   At this point, you can either restrict specific Client access to the Mobility 7131 (using the Mobility 7131 ACL) or test the Mobility 7131 for Client interoperability.

Excluding clients from Mobility 7131 association

Optionally, use the Mobility 7131 *Access Control List ACL* to specify which Clients can or cannot gain access to a Mobility 7131 managed WLAN. By default, all Wireless Clients can gain access. For specific information on configuring (restricting) Client access, refer to the Mobility 7131 *Product Reference Guide*. The guide is available at *http://www.brocade.com/support/*.

Testing mobile unit connectivity

Verify the Mobility 7131's link with an Client by sending *Wireless Network Management Protocol* (WNMP) ping packets to the associated Client. Use the *Echo Test* screen to specify a target Client and configure the parameters of the ping test. The WNMP ping test only works with Brocade Clients. Only use a Brocade Client to test Mobility 7131 connectivity using WNMP. To ping a specific Client to assess its connection with a Mobility 7131:

NOTE
Before testing for connectivity, the target Client needs to be set to the same ESSID as the Mobility 7131. Since WEP 128 has been configured for the Mobility 7131, the Client also needs to be configured for WEP 128 and use the same WEP keys. Ensure the Client is associated with the Mobility 7131 before testing for connectivity.

1. Select *Status and Statistics* - > *Client Stats* from the Mobility 7131 menu tree.
2. Select the *Echo Test* button from within the *Client Stats Summary* screen.
3. Define the following ping test parameters:

Station address	The station address is the IP address of the target Client. Refer to the *Client Stats Summary* screen for associated Client IP address information.
Number of ping	Specify the number of ping packets to transmit. The default is 100.
Packet length	Specify the length of each data packet transmitted to the target Client during the ping test. The default is 100 bytes.

4. Click the *Ping* button to begin transmitting ping packets to the Client address specified.

Refer to the *Number of Responses* value to assess the number of responses from the target Client versus the number of pings transmitted by the Mobility 7131. Use the ratio of packets sent versus packets received to assess the link quality between Client and the Mobility 7131.

Click the *Ok* button to exit the Echo Test screen and return to the Client Stats Summary screen.

With basic Mobility 7131 and associated Client connectivity verified, the Mobility 7131 is now ready to operate as defined within this guide or have its more advanced features configured.

Configuring dependent mode (adaptive) settings

An *adaptive AP* (AAP) can adopt like a Brocade Mobility 300 (L3). An access point needs settings defined to discover (and adopt) an available switch and establish a connection and data tunnel. It's through this switch adoption that the access point receives its AAP configuration. Once an access point connects to a switch and receives its AAP configuration, its WLAN and radio configuration is similar to a thin access point. An AAP's radio mesh configuration can also be configured from the switch. However, non-wireless features (DHCP, NAT, Firewall etc.) cannot be configured from the switch and must be defined using the access point's resident interfaces before AAP conversion.

For detailed information on defining an adaptive AP configuration, refer to the Mobility 7131 *Product Reference Guide*. Chapter 10 of this guide provides a detailed theoretical discussion on the adaptive AP feature, while section 4.3 provides adaptive AP setup information. The guide is available at http://www.brocade.com/support/.

Where to go from here?

Once basic connectivity has been verified, the Mobility 7131 can be fully configured to meet the needs of the network and the users it supports. The sections referenced below are located within the Mobility 7131 *Product Reference Guide.* The guide is available at http://www.brocade.com/support/.

3 Where to go from here?

- Refer to Chapter 4 to define System Settings (beyond the scope of the Quick Setup screen), configure Mobility 7131 device access, set SNMP values, log system events, set the Mobility 7131 system time and import device firmware and configuration files.
- See Chapter 5 for information on configuring the Mobility 7131 LAN and WAN ports, define up to 16 individual WLANs and their QoS policies and configure Mobility 7131 router settings.
- Refer to Chapter 6 for information on configuring specific encryption (WEP, KeyGuard, WPA/TKIP and WPA2/CCMP) and authentication (Kerberos and 802.1x EAP) security schemes.
- See Chapter 7 for information on accessing statistics helpful in monitoring the connection between the Mobility 7131 and its connected devices.
- Refer to Chapter 8 for information on using the Mobility 7131 *Command Line Interface (CLI),* as accessed through the serial port or Telnet.
- See Appendix A for device specifications.

Chapter

4 Regulatory Compliance

All Brocade devices are designed to be compliant with rules and regulations in locations they are sold and will be labeled as required. Any changes or modifications to Brocade equipment, not expressly approved by Brocade, could void the user's authority to operate the equipment.

When Brocade's devices are professionally installed, the Radio Frequency Output Power will not exceed the maximum allowable limit for the country of operation.

Antennas: Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications, or attachments could cause damage and may violate regulations.

Country approvals

Regulatory markings are applied to the device signifying the radio (s) are approved for use in the following countries: United States, Canada, Australia, Japan and Europe.

Please refer to the *Declaration of Conformity* (DoC) for details of other country markings. This is available at *http://www2.symbol.com/doc*.

NOTE
For 2.4GHz Products: Europe includes, Austria, Belgium, Bulgaria, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Operation of the device without regulatory approval is illegal.

Health and safety recommendations

Warnings for the use of wireless devices

Please observe all warning and danger notices with regard to the usage of wireless devices

Potentially hazardous atmospheres

You are reminded of the need to observe restrictions on the use of radio devices in fuel depots, chemical plants etc. and areas where the air contains chemicals or particles (such as grain, dust, or metal powders).

Safety in hospitals

Wireless devices transmit radio frequency energy and may affect medical electrical equipment. When installed adjacent to other equipment, it is advised to verify that the adjacent equipment is not adversely affected.

RF exposure guidelines

Safety information

The device complies with Internationally recognized standards covering human exposure to electromagnetic fields from radio devices.

Reducing RF exposure—use properly

Only operate the device in accordance with the instructions supplied.

Remote and standalone antenna configurations

To comply with FCC RF exposure requirements, antennas that are mounted externally at remote locations or operating near users at stand-alone desktop of similar configurations must operate with a minimum separation distance of 20 cm from all persons.

Power supply

Use only a Brocade approved power supply output rated at 48Vdc and minimum 0.75A. The power supply shall be Listed to UL/CSA 60950-1; and certified to IEC60950-1 and EN60950-1 with SELV outputs.

Use only a Brocade approved power supply. Use of alternative power supply will invalidate any approval given to this device and may be dangerous.

Wireless devices - countries

Country selection

Select only the country in which you are using the device. Any other selection will make the operation of this device illegal.

Operation in the US

The use on UNII (Unlicensed National Information Infrastructure) Band 1 5150-5250 MHz is restricted to indoor use only, any other use will make the operation of this device illegal.

The available channels for 802.11 b/g operation in the US are Channels 1 to 11. The range of channels is limited by firmware.

Radio frequency interference requirements—FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Radio transmitters (Part 15)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radio frequency interference requirements – Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Devices using the 5.470 – 5.725 GHz band shall not be capable of transmitting in the band 5.60-5.65 GHz in Canada, make sure that Canada is the country selected during setup to ensure compliance.

Radio transmitters

This device complies with RSS 210 of Industry & Science Canada. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that permitted for successful communication.

This device has been designed to operate with the antennas listed in section 3.3.1 of this installation guide, and having a maximum gain of 13.9 dBi (2.4 GHz) and 13 dBi (5 GHz). Antennas not included in this list or having a gain greater than 13.9 dBi (2.4 GHz) and 13 dBi (5 GHz) are strictly prohibited for use with this device. The required antenna impedance is
50 ohms.

Label Marking: The Term "IC:" before the radio certification signifies that Industry Canada technical specifications were met.

CE marking and European Economic Area (EEA)

The use of 2.4GHz RLAN's, for use through the EEA, have the following restrictions:

- Maximum radiated transmit power of 100 mW EIRP in the frequency range 2.400 -2.4835 GHz.
- France outside usage, the equipment is restricted to 2.400-2.45 GHz frequency range.
- Italy requires a user license for outside usage.

Japan (VCCI) - voluntary control council for interference

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Korea Warning Statement for Class B

B급 기기 (가정용 방송통신기기): 이 기기는 가정용 (B급) 으로 전자파적합등록을 한 기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

Class B device (Broadcasting Communication Device for Home Use): This device obtained EMC registration mainly for home use (Class B) and may be used in all areas.

Korea MIC/KCC

이 기기는 A급 기기로서, 업무용으로 전자파 적합 등록을 한 기기이오니 판매자 또는 사용자는 이 점을 유의하시기 바라며, 만약 잘못 판매 또는 구입하였을 경우에는 가정용으로 교환하시기 바랍니다.

Statement of compliance

Brocade hereby, declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. A Declaration of Conformity may be obtained from *http://www2.symbol.com/doc*.

NOTICE!

According to: Administrative Regulations on Low Power Radio Waves Radiated Devices

Article 12

Without permission granted by the DGT, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to a approved low power radio-frequency devices.

Article 14

The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is operated in compliance with the Telecommunications Act. The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.

臺灣

低功率電波輻射性電機管理辦法

第十二條
經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信規定作業之無線電通信。
低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

限制頻率範圍是: 2.400 - 2.4835 GHz。 最大發射功率: 27dBm
5.250 - 5.350 GHz。 最大發射功率: 17dBm
5.725 - 5.850 GHz。 最大發射功率: 24dBm

2.4GHz: 11個通道
5GHz: 8個通道

Chapter

5

Waste Electrical and Electronic Equipment (WEEE)

For information on WEEE, please go to:
http://www.brocade.com/company/corporate-citizenship/product-recycling/Overview/index.page.